ABSTRACT OF THE DISCLOSURE

The technique of the present invention produces a first fuel-air mixture containing a first fuel and the air at a specific ratio, which does not allow for auto ignition of the first fuel-air mixture by simple compression, in a combustion chamber. The technique then injects a second fuel, which has a higher octane value than that of the first fuel, into a partial area of the combustion chamber, so as to produce a second fuel-air mixture. The technique ignites the second fuel-air mixture for combustion, so as to compress and auto-ignite the first fuel-air mixture. The second fuel has the higher octane value, so that a combustion start timing of the second fuel-air mixture is reliably regulated by ignition. Namely the technique positively controls the timing of auto ignition of the first fuel-air mixture. Setting an adequate value to the ignition timing thus effectively prevents the occurrence of knocking in an internal combustion engine that adopts a premix compression ignition combustion system.